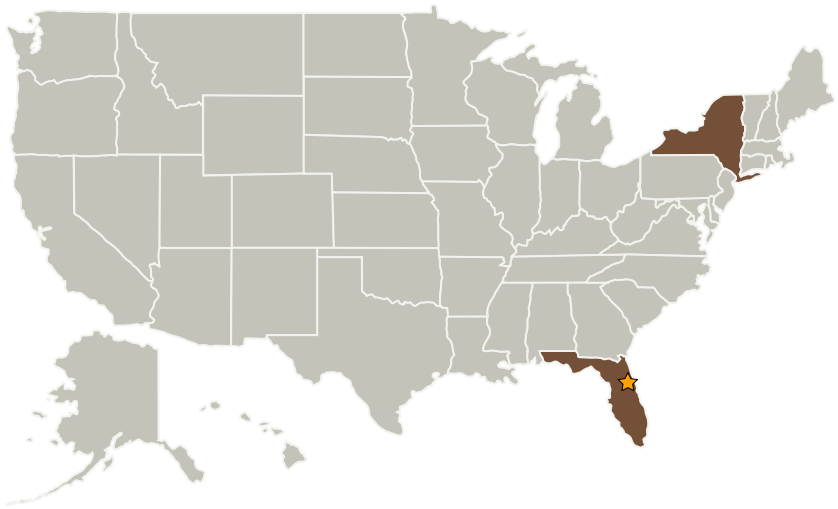
# Microdischarge Array Flexible Light Source for High-Efficiency Irradiation of Spaced-Based Crops, Phase I

Completed Technology Project (2005 - 2005)

## Project Introduction

It is desirable to develop a high-efficiency lighting source for large-area irradiation of space-based crops. The key requirements for such a system include high efficiency, light weight, easy and rapid deployment, compact storage, ruggedness, and low cost. Furthermore, in order to maximize the rate of photosynthesis, it is desirable that the light source deliver an emission spectrum that matches the absorbance spectrum of chlorophyll as closely as possible while minimizing the effects of emission outside of the visible spectrum. To address these demanding requirements and overcome the limitations of alternative technologies, we propose to develop a large-area, high-efficiency, flexible sheet light source using microdischarge arrays using the combined talents of Anvik Corporation and a team from the University of Illinois at Urbana-Champaign, led by Prof. J. Gary Eden. The development of a new technology to enable the fabrication of large-area, high-density microdischarge arrays on flexible substrates, possibly powered by solar cells, will enable dramatic advances in the portability, ruggedness, efficiency, and light quality of light sources for space-based crop irradiation and a wide variety of commercial applications, including LCD backlighting, large-area UV-curing, decorative lighting, photodynamic therapy, and germicidal applications.

## Primary U.S. Work Locations and Key Partners

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## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Center / Facility:**

Kennedy Space Center (KSC)

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work | Role | Type | Location |
|---|---|---|---|
| ★Kennedy Space Center(KSC) | Lead Organization | NASA Center | Kennedy Space Center, Florida |
| Anvik Corporation | Supporting Organization | Industry | Hawthorne, New York |

| Primary U.S. Work Locations | |
|---|---|
| Florida | New York |

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Marc Zemel

## Technology Areas

**Primary:**

- TX08 Sensors and Instruments
  - TX08.1 Remote Sensing Instruments/Sensors
    - TX08.1.1 Detectors and Focal Planes